State of Wisconsin/Department of Transportation

RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: September 30, 2004

Program: SPR-0010(36) FFY99	**Part: II Research and Development**
Project Title: Development of Modulus-to-Temperature Relations For HMA Mixtures in Wisconsin	**Project ID: 0092-03-14**
Administrative Contact: Nina McLawhorn	**Sponsor: Wisconsin Department of Transportation**
WisDOT Technical Contact: Leonard Makowski	**Approved Starting Date: Feb 10, 2003**
Approved by COR/Steering Committee:	**Approved Ending Date: August 10, 2004**
Project Investigator (agency & contact): Marquette University, James A. Crovetti	

Description:

Total study budget	Current FFY budget	Expenditures for current quarter	Total Expenditures to date	Percent Complete
$63,891	**$22,936**	**$10,000**	**$62,009**	**95%**

Progress This Quarter:

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

Deflection testing was completed on selected projects located in Waukesha, Kenosha, Ontario, Boscobel, Rhinelander and Waupun, WI using the WisDOT falling weight deflectometer (FWD). Tests were conducted throughout the day to provide comparable measures over a range of HMA mix temperatures. Three HMA pavement layer cores were extracted from each project at locations coincident with FWD tests. These cores were transported to Michigan Technological University for characterization and laboratory resilient modulus testing. Laboratory resilient modulus testing was completed on all recovered cores using load test frequencies of 1 Hz and 2 Hz and controlled core temperatures of 4, 25 and 40 ^{o}C. Backcalculation analysis of collected deflection data was conducted using multiple techniques to estimate the combined in situ elastic modulus of the HMA layers. These values were used as comparative values to the results of laboratory resilient modulus testing. The results of laboratory testing and the backcalculation analysis were used to develop data trends and predictive equations for estimating HMA modulus of various temperatures based on mixture characteristics.

Work Next Quarter:

The draft final report will be completed and submitted to the Flexible Pavement TOC for review. A revised final report will be submitted based on comments received.

Circumstances affecting progress/budget:

Completion of all deflection testing was delayed until the end of July to accommodate equipment and traffic control scheduling requirements as well as delays in construction of the upper layer on the Waupun project. This extended the anticipated completion time for laboratory testing and backcalculation analysis as well as submission of the final report.

WHRP Project 0092-03-14
Development of Modulus-to-Temperature Relations for HMA Mixtures in Wisconsin
Gantt Chart of Project Activities Through September 30, 2004

Project Task	Calendar 2003									Calendar 2004											% Complete
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
1. Literature Review/Survey																					100
2. Development of Research Factorial & Data Collection Plan																					100
3. Project Identification																					100
4. Conduct Field & Lab Studies																					100
5. Analyze Data & Prepare Guidelines																					90
6. Final Report																					90
Overall project																					95

Proposed
Actual